REMARKS

Examiner rejects claims 1-13 under 35 USC 112 as being based on a disclosure which is not enabling. Specifically, Examiner contends that a suitable definition is not found in the disclosure. However, the term "nanoporous", due to the commonly accepted definition of the prefix "nano" and use of the term by those skilled in the art, is well-known to encompass the values that Examiner has cited. Such a range would generally be restricted to the range between tenths of a nanometer through hundreds of nanometers. A smaller size would generally be termed with the prefix "pico", and larger sizes would generally be preceded with "micro". The term "nano" specifically defines these ranges, and since this is a commonly known definition, it need not be explicitly defined in the specification, and thus claims 1-13 are enabling to those skilled in the art. In fact there are other issued patents using the term nanoporous silica in connection with films, without identifying further the range of sizes this encompasses, because it is commonly understood. If the examiner would be more comfortable with and be agreeable to, we would accept the addition of a comment into the background section acknowledging this range of sizes in the prior art.

Applicant disagrees with Examiner's 35 USC 102(b) rejection on the grounds that claim 1 is anticipated by Bruinsma (US 5,922,299). Although Bruinsma does generally describe the potential usefulness of porous silica films as "coatings on fibers and other structures," (col. 2, lines 17-18), it nowhere describes optical fiber diffusers having a nanoporous silica cladding and a solid silica core as described in the present invention.

First of all a few points need to be made with reference to the state of the art, and the differences between words loosely equated in general use but with special meaning in the art of optical fibers and sensing applications. A fiber optic 'cladding' is not merely a coating or film. It generally is differentiated from coatings in that it must have a range of optical properties in addition to mechanical and chemical properties. A cladding material must be transparent at the operating wavelengths as well as have a refractive index below that of the core material which it surrounds. A substance with pores in it will have an effective refractive index related to the index of refraction of its components and their relative concentrations in a unit 'cell'. The effective size of the cell will depend on the wavelength of the light traveling through the material. Since in the

visible/near infrared [VIS/NIR] region of the spectrum, the wavelengths are between about 400 nm and about 1500 nm, the pores need to be in the region of about ¼ or less of these dimensions. In the present invention the point is that the diffuser section is made from a section of the nanoporous clad optical fiber. So until portions of this nanoporous clad are modified to create scattering sites, the nanoporous silica must behave like a cladding, allowing the fiber to be a good transmission medium for light in various wavelengths throughout the visible and NIR regions of the electromagnetic spectrum. With the withdrawal of Figures 5 and 6, all the diffusers claimed are based on the diffusing section being created from a silica core/nanoporous silica clad optical fiber by modifications of sections of the nanoporous cladding near the distal end of the fiber. Possible modifications include those called out in claims 2, 5, 9, 10, 11, 12, 21.

Bruinsma, '229, does speak of a mesoporous silica film and also of a mesoporous silica fibers. The fibers though are not optical fibers but merely fiber strands or a "gauze-like product" (column 14, lines 44-49) which would be useful for filtration. Further the presence of multi-phases and lack of transparency is noted in column 15 lines 51-52, "The as-spun, dried, and calcined fibers all showed birefringence between cross polarizers in an optical microscope." Thus nothing in '229 anticipates nor describes the optical fiber with a nanoporous silica cladding, which is modified in sections to provided a diffuser section of the optical fiber.

Since the references Sinofsky (US 6,270,492), Doiron et al. (US 5,269,777) deal simply with variations of the common type of diffuser where a scattering or reflecting section is attached to the end of a standard optical fiber, these significantly differ from the currently claimed invention (embodiments in Figures 5-6 are withdrawn). The present invention has a transmitting core and a nanoporous cladding which becomes the diffuser when the cladding is modified as described. These two patents by themselves thus add nothing lacking from '229 to make obvious any of the claims as now presented. Also, there is no suggestion or motivation for one skilled in the art to combine the teachings of the above references with '229.

Since the combination of '229 and '777 do not teach or imply the fiber structure of the current invention diffuser, the addition of Mori (US 4,678,279) adds nothing which can make obvious claims 9, 10 of the present invention, even if one could find a reason to combine the three patents from such diverse fields.

With these changes and remarks it is believed that the disclosure is now in condition for allowance. Reconsideration is respectfully requested. An early and favorable response is earnestly

solicited. If necessary, a telephone call would be appreciated to discuss any further final changes to be made to render the claims allowable. Thank you.

Respectfully submitted,

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